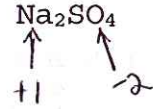
Chemistry 129

Oxidation Numbers

Determine the oxidation numbers of all the atoms in the following:

1. Na_2SO_4



$2(+1) + S + 4(-2) = 0$

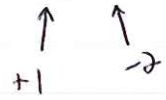
$S = +6$

2. NO_3^-

$N + 3(-2) = -1$

$N = +5$

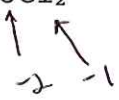
3. $HBrO$



$(+1) + Br + (-2) = 0$

$Br = +1$

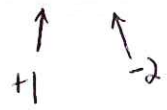
4. $COCl_2$



$C + (-2) + 2(-1) = 0$

$C = +4$

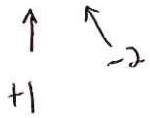
5. $KMnO_4$



$(+1) + Mn + 4(-2) = 0$

$Mn = +7$

6. HCO_3^-



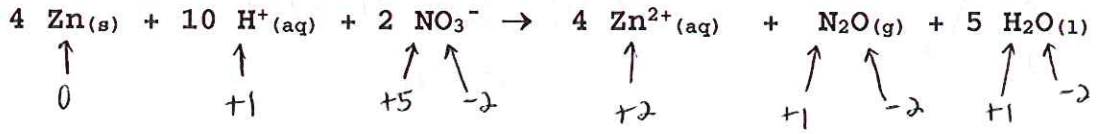
$(+1) + C + 3(-2) = -1$

$C = +4$

Chemistry 129

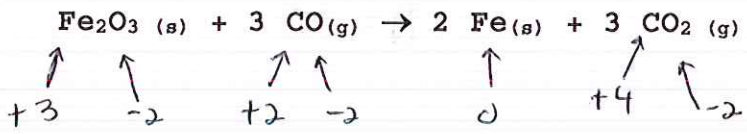
Oxidation-Reduction (Redox) Reactions

Balance the reactions below and determine the oxidation numbers of all atoms. What atom is reduced and which is oxidized?



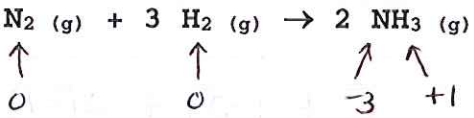
Zn: 0 → +2 oxidized

N: +5 → +1 reduced



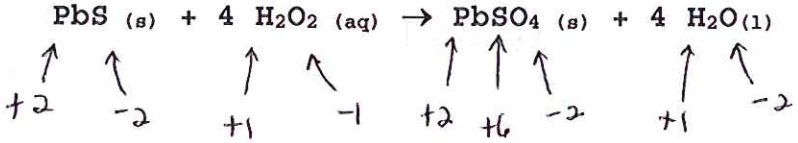
Fe: +3 → 0 reduced

C: +2 → +4 oxidized



N: 0 → −3 reduced

H: 0 → +1 oxidized



S: −2 → +6 oxidized

O: −1 → −2 reduced